ITRI 613 -Ass 3(MEMO)

Due Date: 09/05/2021

Relational Algebra Expressions (PART A)

Product (make, <u>model</u>, type)

PC (<u>model</u>, speed, ram, hd, price)

Laptop (<u>model</u>, speed, ram, hd, screen, price)

Printer (<u>model</u>, color, type, price)

Given the above schema from the RELAX Database example set. Solve all queries below using only select, project, Cartesian product, and natural join. Do not use theta-join, set operations, renaming or assignment. Provide the relational algebra expressions and the screenshots after executing each query on RELAX.

1. Find all prices for laptops that are above R1000.

    πprice (σ price > 1000 (Laptop))

2. Find all printers that are laser and that are color printers.

    σ type = 'laser' and color = true (Printer)

3. Find all printers that are below R500 that are inkjet printers.

    σ price < 500 and type = 'ink-jet' (Printer)

4. Find all PC's that have speed equal to 3.2 and HD size above 200

    σ speed = 3.2 and HD > 200 (PC)

5. Project product model only for all Laptops that are Maker A or Maker B.

    π model (σ maker = 'A' or maker = 'B' (Product ⋈ Laptop))
    OR π model σ maker = 'A' or maker = 'B' and type = 'laptop' (Product)

Relational Algebra Expressions (PART B)

Employee (Name, <u>EmpId</u>, DeptName)

Dept (DeptName, Manager)

Completed (Student, Task)

DBProject (Task)

Car (<u>CarModel</u>, CarPrice)

Boat (<u>BoatModel</u>, BoatPrice)

Given the above Wikipedia schema from the RELAX Database example set. Solve all queries below. Provide the relational algebra expressions and the screenshots after executing each query on RELAX.

1. Find all Employees who work finance.
   σ DeptName = 'Finance' (Employee)

2. Find all boats with prices that are above R3000.
   σ BoatPrice > 3000 (Boat)

3. Join both Employee and Car and project cars for employees that are from the 'sales' department.
   π CarModel σ DeptName= 'Sales' (Employee ⋈Car)

4. From Completed find all students who completed 'Compiler 1', and 'Database 1'.

π Student σ Task = 'Database1' (Completed) ∩ π Student σ Task = 'Compiler1' (Completed)

5. From Completed find all students who completed 'Compiler 1', or 'Database 2'.

π Student σ Task = 'Compiler1' or Task = 'Database1' (Completed)